

CLAIMS

1. A radio communication system having a communication channel comprising a plurality of paths between a transmitter having a plurality of antennas and a receiver having at least one antenna, wherein the transmitter comprises path characterisation means for determining at least one transmission property of each path, categorisation means for assigning a category to a set of data for transmission and mapping means responsive to said category and said at least one transmission property for determining a mapping to apply the set of data to the transmitter's antennas, thereby determining over which path or paths the data will be transmitted.

2. A system as claimed in claim 1, characterised in that the receiver comprises means for performing channel estimation and means for signalling details of the output of the channel estimation to the path characterisation means.

3. A transmitter for use in a radio communication system having a communication channel comprising a plurality of paths between a transmitter having a plurality of antennas and a receiver, wherein path characterisation means are provided for determining at least one transmission property of each path, categorisation means are provided for assigning a category to a set of data for transmission, and mapping means responsive to said category and said at least one transmission property are provided for determining a mapping to apply the set of data to the transmitter's antennas, thereby determining over which path or paths the data will be transmitted.

4. A transmitter as claimed in claim 3, characterised in that data for transmission may be provided from a plurality of sources and in that the categorisation means is adapted to assign a category depending on the source of the data.

5. A transmitter as claimed in claim 3, characterised in that the categorisation means is adapted to assign different categories to respective segments of data from an application depending on at least one of their relative importance, required quality of service, data rate, tolerable transmission delay and tolerable error rate.

6. A transmitter as claimed in claim 3, characterised in that the path characterisation means is adapted to determine at least one of a delay, a signal-to-noise ratio, and a required transmission power for a given signal-to-noise ratio or error rate for each path.

7. A transmitter as claimed in claim 3, characterised in that parameter selection means are provided for setting at least one transmission parameter relating to the data depending on at least one of the path (or paths) assigned for transmission of the data and the category assigned to the data.

8. A transmitter as claimed in claim 7, characterised in that a transmission parameter specifies the type of error control coding added to the data.

9. A transmitter as claimed in claim 7, characterised in that a transmission parameter specifies the modulation scheme to be used for transmission of the data.

10. A transmitter as claimed in claim 7, characterised in that a transmission parameter specifies the transmission power of each of the antennas, thereby enabling a particular signal-to-noise ratio to be achieved for at least one signal path.

11. A transmitter as claimed in claim 3, characterised by being distributed at a plurality of spatially-separated sites, each site comprising at least one antenna.

12. A transmitter as claimed in claim 3, characterised in that the path characterisation means are adapted to determine properties of the paths at least partly from measurements made by the receiver and signalled to the transmitter.

13. A method of operating a radio communication system having a communication channel comprising a plurality of paths between a transmitter having a plurality of antennas and a receiver having at least one antenna, the method comprising the transmitter determining at least one transmission property of each path, assigning a category to a set of data for transmission and determining a mapping to apply the set of data to the transmitter's antennas depending on said category and said at least one transmission property, thereby determining over which path or paths the data will be transmitted.

14. A method as claimed in claim 13, characterised by transmitting data requiring a higher quality of service over a better sub-channel than data requiring a lower quality of service.